SECTION 465323 - TRICKLING FILTER ROTARY DISTRIBUTOR EQUIPMENT

Note that this section has only been edited for NYSOGS standardization and has not been technically edited. The designer shall make all technical edits specific to the project for this section.

This Section includes trickling filter rotary distributor arms and accessories for wastewater treatment facilities. Equipment specified in this Section distributes sewage over the filter bed by rotating from the reaction thrust of sewage flowing through jets or nozzles in the distributor arms. Motor-driven rotary distributor equipment is also available from some manufacturers.

1. GENERAL
	* + 1. SUMMARY
				1. Section Includes: Trickling filter rotary distributor equipment.
				2. Related Requirements:

List other Sections directly related to or affecting Work of this Section. Include Sections specifying information expected to be found in this Section as well as Sections required to describe complete system or assembly requirements.

Section 460548 - Vibration and Seismic Controls for Water and Wastewater Equipment: Requirements for vibration and seismic control for equipment specified in this Section.

Section 460553 - Identification for Water and Wastewater Equipment: Nameplates for equipment specified in this Section.

* + - 1. REFERENCE STANDARDS

List reference standards included within text of this Section, with designations, numbers, and complete document titles.

* + - * 1. American Bearing Manufacturers Association:

ABMA 9 - Load Ratings and Fatigue Life for Ball Bearings.

ABMA 11 - Load Ratings and Fatigue Life for Roller Bearings.

* + - * 1. American Water Works Association:

AWWA C151 - Ductile-Iron Pipe, Centrifugally Cast.

* + - * 1. ASTM International:

ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

* + - * 1. Material: [**Ductile iron, AWWA C151/A21.51**] [**or**] [**steel, ASTM A53**].
			1. COORDINATION
				1. Coordinate Work of this Section with Work of other Sections.
			2. PREINSTALLATION MEETINGS
				1. Convene minimum [**one week**] [**<\_\_\_\_\_\_\_\_> weeks**] prior to commencing Work of this Section.
			3. SUBMITTALS

Only request submittals needed to verify compliance with Project requirements.

* + - * 1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
				2. Manufacturer’s installation instructions shall be provided along with product data.
				3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
				4. Product Data: Submit manufacturer's product information for system materials and component equipment.
				5. Shop Drawings:

Submit detail drawings indicating equipment layout.

Indicate system materials and component equipment.

Submit installation and anchoring requirements, fasteners, and other details.

* + - * 1. Manufacturer's Certificate: Certify that [**products**] <**\_\_\_\_\_\_\_\_**> meet or exceed [**specified requirements**] <**\_\_\_\_\_\_\_\_**>.

Certify that installation is completed according to manufacturer's instructions.

Include separate Paragraphs for additional certifications.

* + - * 1. Manufacturer's Instructions: Submit detailed instructions on installation requirements, including storage and handling procedures.
				2. Source Quality-Control Submittals: Indicate results of [**shop**] [**factory**] tests and inspections.
				3. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
				4. Manufacturer Reports: Certify that equipment has been installed according to manufacturer's instructions.
				5. Qualifications Statement:

Coordinate following Subparagraph with the requirements specified in QUALIFICATIONS Article.

Submit qualifications for manufacturer.

* + - 1. CLOSEOUT SUBMITTALS
				1. Project Record Documents: Record actual locations of installed trickling filter rotary distribution equipment.
				2. Operation and Maintenance Data: Submit maintenance instructions for equipment and accessories.
			2. MAINTENANCE MATERIAL SUBMITTALS
				1. Extra Stock Materials:

Furnish six months' supply of manufacturer's recommended lubricant.

* + - * 1. Tools: Furnish special [**wrenches**] <**\_\_\_\_\_\_\_\_**> and other devices required for Director’s Representative to maintain and calibrate equipment.
			1. QUALITY ASSURANCE

Include this Article to specify compliance with overall reference standards affecting products and installation included in this Section.

In following Paragraph insert "State of New York Department of Transportation," "Municipality of \_\_\_\_\_\_\_\_ Department of Public Works," or other agency as appropriate.

* + - * 1. Perform Work according to <**\_\_\_\_\_\_\_\_**> standards.

Include following Paragraph only when cost of acquiring specified standards is justified.

* + - * 1. Maintain <**\_\_\_\_\_\_\_\_**> [**copy**] [**copies**] of each standard affecting Work of this Section on Site.
			1. QUALIFICATIONS

Coordinate following Paragraph with requirements specified in SUBMITTALS Article.

* + - * 1. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum [**three**] <**\_\_\_\_\_\_\_\_**> years' [**documented**] experience.
			1. DELIVERY, STORAGE, AND HANDLING
				1. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
				2. Store materials according to manufacturer's instructions.
			2. EXISTING CONDITIONS
				1. Field Measurements:

Verify field measurements prior to fabrication.

Indicate field measurements on Shop Drawings.

* + - 1. WARRANTY

This Article extends warranty period beyond one year. Extended warranties may increase construction costs and Owner enforcement responsibilities. Specify warranties with caution.

* + - * 1. Furnish [**10**] <**\_\_\_\_\_\_\_\_**>-year manufacturer's warranty for trickling filter rotary distribution equipment.
1. PRODUCTS
	* + 1. PERFORMANCE AND DESIGN CRITERIA
				1. Filter Bed Inside Diameter: <**\_\_\_\_\_\_\_\_**> feet
				2. Design Flow Rates:

Minimum: <**\_\_\_\_\_\_\_\_**> gpm

Maximum: <**\_\_\_\_\_\_\_\_**> gpm

Average: <**\_\_\_\_\_\_\_\_**> gpm

* + - * 1. Total Head Available at Inlet: <**\_\_\_\_\_\_\_\_**> feet at maximum design flow rate.
				2. Maximum Velocity in Arms: 4.0 ft/s
				3. Loadings: Design for weight of equipment plus liquid, wind loading, live loading of <**\_\_\_\_\_\_\_\_**> lb [**, and**] [**ice coating of <\_\_\_\_\_\_\_\_> inches thickness**].
				4. Maximum Vertical Deflections at End of Distributor Arms: 4.0 inches
				5. Arms Clearance above Filter Bed Surface: As indicated on Drawings.
			1. TRICKLING FILTER ROTARY DISTRIBUTORS
				1. [Manufacturers](http://www.specagent.com/LookUp/?ulid=11977&mf=04&src=wd):

DESIGNER TO PROVIDE TWO MANUFACTURERS AND APPROVED EQUIVALENT FOR ALL LISTED PRODUCTS.

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

In following Subparagraph insert "State of New York Department of Transportation," "Municipality of \_\_\_\_\_\_\_\_ Department of Public Works," or other agency as appropriate.

Furnish materials according to <**\_\_\_\_\_\_\_\_**> standards.

Insert descriptive specifications below to identify Project requirements and to eliminate conflicts with products specified above.

* + - * 1. Description:

Distributes sewage over filter bed at indicated rate by rotating from reaction thrust of sewage flowing through jets or nozzles in distributor arms.

Furnish distributor arms, center column, and accessories.

* + - * 1. Center Column:

Type: [**Mast**] [**Turntable**].

Stationary Assembly:

Material: [**Cast iron**] [**Structural steel**] [**Steel pipe**] [**Aluminum**] <**\_\_\_\_\_\_\_\_**>.

Inlet Diameter: <**\_\_\_\_\_\_\_\_**> inches

Rotating Assembly:

Material: [**Cast iron**] [**Structural steel**] [**Steel pipe**] [**Aluminum**] <**\_\_\_\_\_\_\_\_**>.

[**Turntable Material: Cast iron.**]

[**Adjustable Weir:**]

[**Description: Divide flow between primary and secondary arms such that only primary arms will operate at minimum flow rate and primary and secondary arms will discharge uniformly at maximum flow rate.**]

[**Accessible for adjustment without removing other equipment.**]

Mechanical Seal:

Annular Ring: Replaceable [**neoprene**] [**PTFE**].

Seals between Vertical Surfaces: Spring-loaded in steel retainer rings.

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

Air Gap: Provide relief device to prevent liquid level in rotating equipment from rising to air gap elevation.

Bearings:

Radial and Axial Loads: Ball or roller type.

Bearing life is percent failure at rated hours; e.g., L10 life at 100,000 hours means 10 percent of bearings may be expected to fail at 100,000 hours.

Bearings: Minimum L10 life of [**100,000 hours**] <**\_\_\_\_\_\_\_\_**>, according to ABMA [**9**] [**11**].

Furnish guide bearings to maintain alignment.

Lubrication:

[**Grease**] [**or**] [**oil**].

Greased Bearings: Furnish fittings for grease gun service, with tubing extender if required to reach convenient location.

Oil Reservoir: Furnish fill opening with overflow to prevent overfilling, oil-level sight glass, and drain at lowest point.

Anchor Bolts, Hex Nuts, and Washers: Type 304 stainless steel.

* + - * 1. Distributor Arms:

Mounting: Attach to rotating assembly by flanged or screwed connections.

Material: [**Steel pipe with minimum wall thickness of 1/4 inch**] [**Aluminum**] <**\_\_\_\_\_\_\_\_**>.

Flushing: Provide quick-opening shear gate at end of each arm.

Support:

From rotating assembly.

[**Cables**] [**steel tie rods with turnbuckles**] [**or**] [**steel truss**].

Lateral Bracing: Horizontal steel tie rods with turnbuckles.

Provide non-clogging openings in each arm to distribute flow uniformly over filter bed.

Nozzles and Spreaders:

Material: Corrosion-resistant, nonferrous.

Nozzles: Design for maximum reactive thrust with minimum head loss.

Spreaders:

Design to disperse flow evenly from each opening.

Removable for cleaning.

Furnish replaceable orifices permitting variation of flow capacity.

Furnish rectangular-arm distributors with non-clogging orifices in spreaders.

* + - * 1. Center Pier Supply Junction Fitting:

Description: [**Base tee and riser pipe**] [**Base plate with riser pipe and flange**].

Inlet Size: <**\_\_\_\_\_\_\_\_**> inches

Material: [**Ductile iron, AWWA C151**] [**or**] [**steel, ASTM A53**.

* + - 1. SOURCE QUALITY CONTROL
				1. Provide shop inspection and testing of completed assemblies.

Include one or both of following Paragraphs to require Director's inspection or witnessing of test at factory.

* + - * 1. Director’s Inspection: Make completed clarifier equipment available for inspection at manufacturer's factory prior to packaging for shipment. Notify Director’s Representative at least [**seven**] <**\_\_\_\_\_\_\_\_**> days before inspection is allowed.
				2. Director’s Witnessing: Allow witnessing of factory inspections and test at manufacturer's test facility. Notify Director’s Representative at least [**seven**] <**\_\_\_\_\_\_\_\_**> days before inspections and tests are scheduled.

Include following Paragraph if reliance on fabricator's approved quality-control program is sufficient for Project requirements.

* + - * 1. Certificate of Compliance: If fabricator is approved by authorities having jurisdiction, submit certificate of compliance indicating Work performed at fabricator's facility conforms to Contract Documents.

Specified shop tests are not required for Work performed by approved fabricator.

1. EXECUTION
	* + 1. EXAMINATION
				1. Verify that tank, piping, and other facilities are ready to receive trickling filter rotary distributor equipment.
			2. INSTALLATION
				1. Install trickling filter rotary equipment according to manufacturer's instructions.
				2. [**Weir Plates: Mount weir plates against double bead of sealant.**]

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

In following Paragraph insert "State of New York Department of Transportation," "Municipality of \_\_\_\_\_\_\_\_ Department of Public Works," or other agency as appropriate.

* + - * 1. Installation Standards: Install Work according to <**\_\_\_\_\_\_\_\_**> standards.
			1. FIELD QUALITY CONTROL
				1. Wet Startup: Run equipment with wastewater and verify proper alignment and operation.
				2. Manufacturer Services: Furnish services of manufacturer's representative experienced in installation of products furnished under this Section for not less than <**\_\_\_\_\_\_\_\_**> days on Site for installation, inspection, field testing, and instructing Director’s Representative in maintenance of equipment.
				3. Equipment Acceptance:

Adjust, repair, modify, or replace components failing to perform as specified and rerun tests.

Make final adjustments to equipment under direction of manufacturer's representative.

* + - * 1. Furnish installation certificate from equipment manufacturer's representative attesting equipment has been properly installed and is ready for startup and testing.
			1. DEMONSTRATION
				1. Demonstrate equipment startup, shutdown, routine maintenance, and emergency repair procedures to Director’s Representative.

END OF SECTION 465323